NASA GODDARD SPACE FLIGHT CENTER

TECHNOLOGY INFUSION

GMSEC

GSFC Mission Services Evolution Center

Integrated Trending and Plotting System (ITPS)

At A Glance

ITPS is a flexible and complete trending and plotting solution which provides user access to an entire mission full-resolution spacecraft telemetry archive using inexpensive PC's and COTS and GOTS products, reducing the operations and sustaining engineering costs of trend analysis.

Benefits

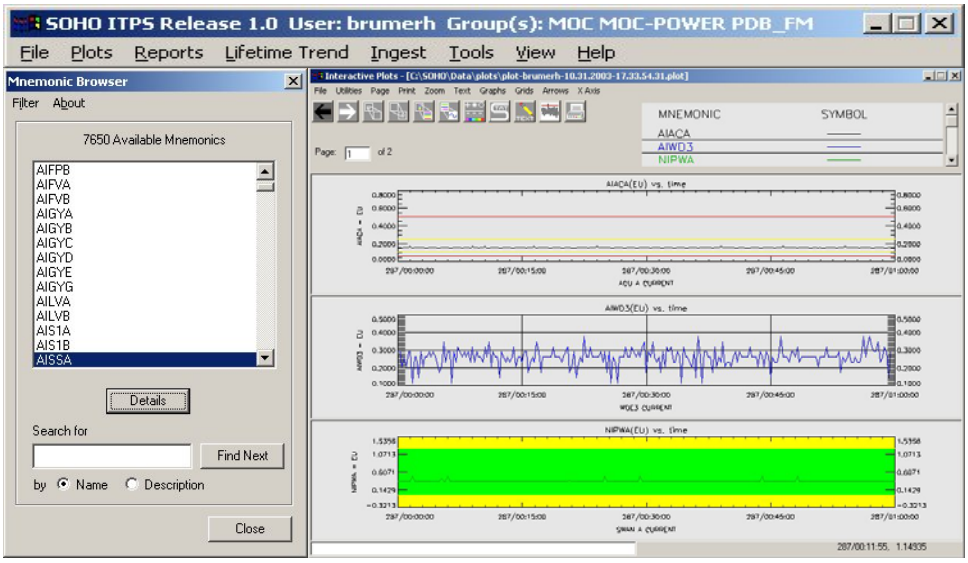
- Modular design allows use in various missions
- Smooth operational transition and minimal training costs
- Fully automated for lights-out operations
- Reduces trend analysis operations and sustaining engineering costs

Features

- Flexible and precise data retrieval
- Based on established GSFC GOTS product (easy upgrade, short learning curve)
- Based on Mission Project Database (PDB)
- Highly Adaptable and Configurable
- GMSEC-compliant
- Secure Remote Web Access

Summary

ITPS is a comprehensive system for the storage, extraction and analysis of spacecraft housekeeping telemetry data. ITPS provides flight operations personnel, engineers, and experimenters with access to the complete full-resolution mission telemetry data archive. In addition, ITPS maintains a lifetime trend data archive of telemetry compiled into mnemonic statistics. Using precise filtering, reporting and plotting capabilities, the ITPS can analyze data via the generation of telemetry plots and reports. The ITPS secure remote web component supports external user requests and allows offsite operator access.



ITPS Main User Interface, Mnemonic Browser, and Mnemonic vs. Time Plot Display

Mission Benefits

- Reduces operations and sustaining engineering costs of trend analysis by replacing the Generic Trending and Analysis System (GTAS), currently used by SOHO and WIND/POLAR missions (whose hardware and software has become obsolete and expensive to maintain).
- Provides access to full resolution of mission data as well as mnemonic statistics.
- Time to perform telemetry analysis shortened from up to 7 days to a few hours.
- Familiar interface to plotting capability provides for smooth transition to operations and minimal training costs.
- Web access frees operator handling of external user requests and allows offsite (after hours) operator access.

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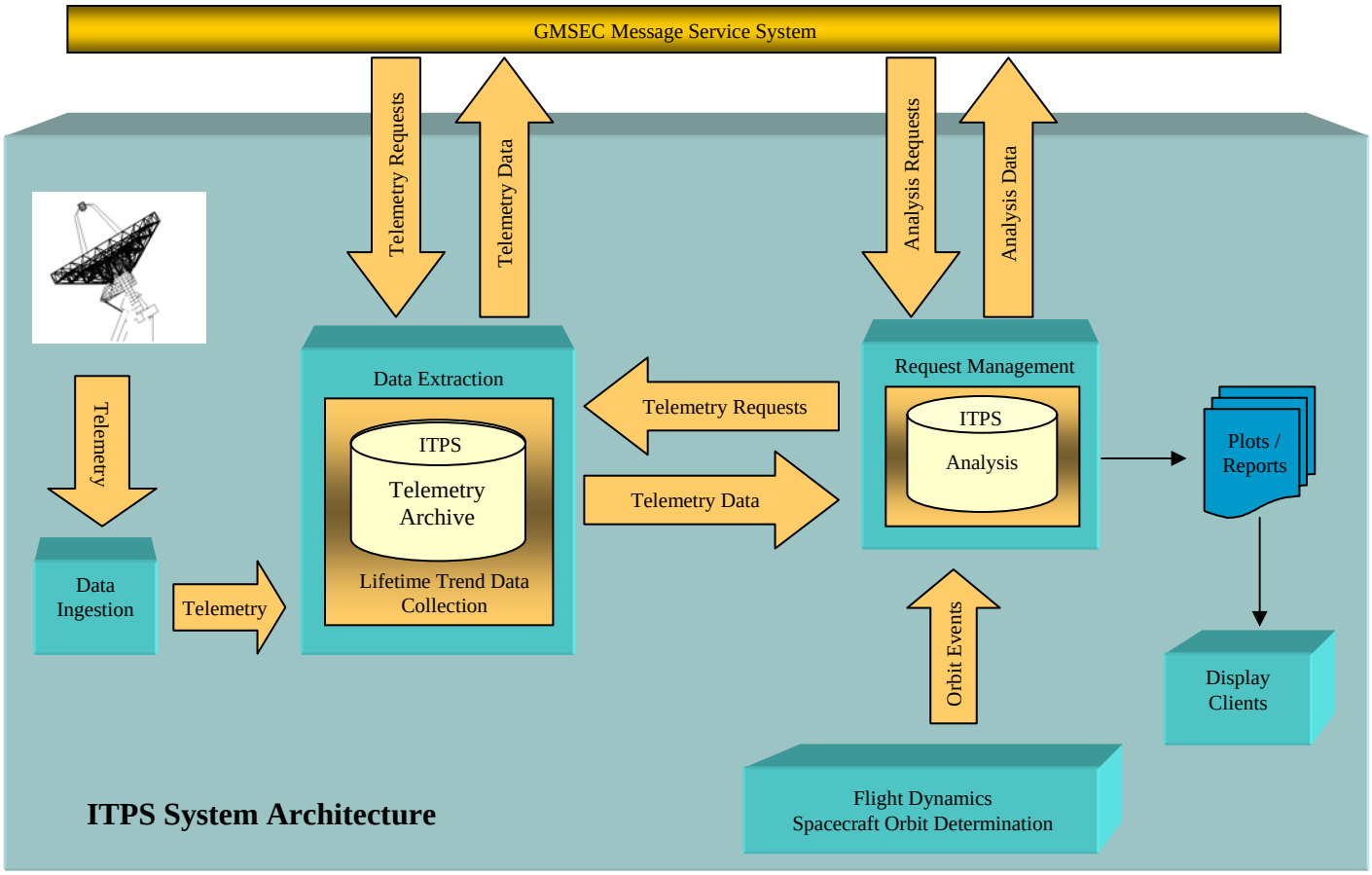
GMSEC ITPS



ITPS Components

The ITPS has a simple client-server architecture that interfaces with the message service server via the GMSEC API which requests and receives telemetry data for distribution to other GMSEC-enabled components.

- Data Ingestion automatically detects mission specific raw housekeeping telemetry files and ingests the data into the Telemetry Archive. The Telemetry Archive contains the full resolution of spacecraft raw housekeeping telemetry data.
- Data Extraction extracts and displays housekeeping telemetry data using Input Definition Files (IDF). Data sources can be either the full resolution Telemetry Archive or the reduced resolution Lifetime Trend Statistics Collection which contains daily, hourly or by-orbit mnemonic statistics including maximum, minimum, mean, standard deviation, and number of points.
- Request Management allows extracted data to be viewed and analyzed as a comma separated report or graphically via a plot. In addition, orbit events data from Flight Dynamics Orbit Determination can be integrated with housekeeping telemetry producing orbit "aware" telemetry data for analysis.
- Data Plots allow custom plots of mnemonics vs. time and mnemonic vs. mnemonic. Users may specify a host of plot options including x-y axis scales and units, mnemonic values in Raw or EU units, save graphs as GIF, JPG, or Postscript files, and curve fitting and extrapolation computations.
- Data Reports provide a graphical user interface for generating, viewing, and printing all types of telemetry reports including ASCII, Statistics, Limit, and Mnemonic Change (delta limit) reports.

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